

**Appl. No. 10/716,006
Amendment Dated March 20, 2006
Reply to Office Action of December 28, 2005**

Remarks/Arguments

Claims 1–53 are pending in the present application. Claims 43–49 have been withdrawn. Claims 1–42 and 50–53 stand rejected. Claims 50 and 52 are amended to correct an error. These amendments do not narrow the claims. Claim 1 has been amended as discussed below.

Various claims of the application stand rejected under 35 U.S.C. § 102(b) as allegedly anticipated by one or more references cited in the Office Action.

“To anticipate a claim, a reference must disclose every element of the challenged claim and enable one skilled in the art to make the anticipating subject matter.” *PPG Indus., Inc. v. Guardian Indus. Corp.*, 37 USPQ2d 1618, 1624 (Fed. Cir. 1996); *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick*, 221 USPQ 481, 485 (Fed. Cir. 1984) (“Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim.”); MPEP § 2131. “The identical invention must be shown in as complete detail as is contained in the ... claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236 (Fed. Cir. 1989); MPEP § 2131. “The elements must be arranged as required by the claim.” MPEP § 2131, citing *In re Bond*, 910 F.2d 831 (Fed. Cir. 1990). “Moreover, it is incumbent upon the examiner to identify wherein each and every facet of the claimed invention is disclosed in the applied reference.” *Ex parte Levy*, 17 USPQ2d 1461, 1462 (Bd. Pat. App. & Int. 1990).

Every Element of Claims 1 and 21 is not Disclosed by U.S. Pat. No. 6,127,068

Claims 1, 2, 6–8, 21, 22, and 26–28 stand rejected under 35 U.S.C. § 102(b) as assertedly anticipated by U.S. Pat. No. 6,127,068 to Shoki, et al. Claims 1 and 21 are independent claims. The Office Action asserts that Shoki et al. discloses the claimed method of deposition of silicon carbide on a substrate using the claimed precursors.

Shoki et al. ‘068 does not disclose every element of independent claim 1 or 21. Shoki et al. ‘068 does disclose a silicon carbide film, a silicon precursor, and a carbon precursor. But Shoki et al. ‘068 does not disclose supplying carbon precursor at a predetermined fixed flow rate, as claimed in claims 1 and 21. Nor does Shoki et al. ‘068 disclose supplying silicon precursor at

predetermined fixed flow rate and controlling the stress in the deposited silicon carbide film by controlling pressure in the reaction chamber, as claimed in claim 1. Shoki et al. '068 also does not disclose maintaining the reaction chamber at a predetermined pressure and controlling silicon precursor flow rate to control the stress in the deposited silicon carbide film, as claimed in claim 21. Shoki et al. '068 does not disclose any process details relating to the silicon carbide deposition. Shoki et al. '068 does not disclose adjusting deposition parameters to control stress in a deposited film as claimed in the present application.

Because Shoki et al. '068 does not disclose every element of claims 1 or 21, it is improper to reject these claims as anticipated by Shoki et al. '068. Therefore, applicants respectfully request that the rejection under Shoki et al. '068 be withdrawn.

Every Element of the Independent Claims is not Disclosed by U.S. Pat. No. 5,390,626

Claims 1, 2, 4–22, 24–42, and 50–53 stand rejected under 35 U.S.C. § 102(b) as assertedly anticipated by U.S. Pat. No. 5,390,626 to Nagasawa, et al. Claims 1, 21, 41, 42, 50, and 52 are independent claims. The Office Action asserts that Nagasawa et al. '626 discloses the claimed method of deposition of silicon carbide on a substrate using the claimed precursors within the claimed temperature, flow rate, and pressure.

Nagasawa et al. '626 does not disclose every element of independent claims 1, 21, 41, 42, 50, and 52. Nagasawa et al. '626 does not disclose controlling stress in the deposited silicon carbide or ceramic film by controlling the pressure in the reaction chamber, as claimed in claims 1 and 50, or controlling the pressure in the reaction chamber to achieve the desired stress value, as claimed in claim 41. Nor does Nagasawa et al. '626 disclose controlling the silicon precursor or metallic element flow rate to control the stress in the deposited silicon carbide or ceramic, as claimed in claims 21 and 52, or controlling the flow rate of silicon precursor to achieve the desired stress value, as claimed in claim 42.

Nagasawa et al. '626 does not disclose control of stress in the deposited silicon carbide. Nagasawa et al. '626 only discloses stress in relationship with positional differences of the substrates in the chamber and the flow velocity of source gases. Col. 4, lines 42–51. There is no discussion of control of stress. Nor are the corresponding arrangements of fixed and variable parameters in the independent claims present, as disclosed in the detail of the claims. Nagasawa

et al. ‘626 does not disclose adjusting deposition pressure and silicon flow rate parameters to control stress in a deposited film as claimed in the present application.

Because Nagasawa et al. ‘626 does not disclose every element of the independent claims, it is improper to reject these claims as anticipated by Nagasawa et al. ‘626. Therefore, applicants respectfully request that the rejection under Nagasawa et al. ‘626 be withdrawn.

Nagasawa et al. ‘370 Does Not Disclose Every Element of the Claims

Claims 1, 2, 4–22, 24–42, and 50–53 stand rejected under 35 U.S.C. § 102(b) as assertedly anticipated by U.S. Pat. No. 5,254,370 to Nagasawa, et al. Claims 1, 21, 41, 42, 50, and 52 are independent claims. The Office Action asserts that Nagasawa et al. ‘370 discloses the claimed method of deposition of silicon carbide on a substrate using the claimed precursors within the claimed temperature, flow rate, and pressure.

Nagasawa et al. ‘370 does not discuss stress of a silicon carbide film or a ceramic film and does not disclose control of any film stress, as claimed in the independent claims of the present application. Nor are the corresponding arrangements of fixed and variable parameters in the independent claims present, as disclosed in the detail of the claims. Nagasawa et al. ‘370 does not disclose adjusting deposition parameters to control stress in a deposited film as claimed in the present application.

Because at least these elements of the independent claims of the present application are not disclosed in Nagasawa et al. ‘370, rejection of these claims under 35 U.S.C. § 102(b) as anticipated by Nagasawa et al. ‘370 is improper. Applicants respectfully request withdrawal of this rejection under Section 102 (b).

Claims of the Present Application are Not Anticipated by Eshita et al. ‘254

Claims 1, 2, 5–22, 25–42, and 50–53 stand rejected under 35 U.S.C. § 102(b) as assertedly anticipated by U.S. Pat. No. 4,855,254 to Eshita, et al. Claims 1, 21, 41, 42, 50, and 52 are independent claims. The Office Action asserts that Eshita et al. ‘254 discloses the claimed method of deposition of silicon carbide on a substrate using the claimed precursors within the claimed temperature, flow rate, and pressure.

Eshita et al. ‘254 discusses control of stress of a silicon carbide film by depositing an

**Appl. No. 10/716,006
Amendment Dated March 20, 2006
Reply to Office Action of December 28, 2005**

intermediate buffer layer between the substrate and the deposited film. Col. 1, lines 56–61.

Eshita et al. '254 does not otherwise discuss control of stress, but does discuss the deposition of this intermediate layer. Eshita et al. '254 does not disclose control of stress in the deposited film by control of pressure or by control of the flow rate of a silicon or metallic precursor, as claimed in the independent claims of the present application. Nor are the corresponding arrangements of fixed and variable parameters in the independent claims present, as disclosed in the detail of the claims. Eshita et al. '254 does not disclose adjusting deposition parameters to control stress in a deposited film as claimed in the present application.

Because at least these elements of the independent claims of the present application are not disclosed in Eshita et al. '254, rejection of these claims under 35 U.S.C. § 102(b) as anticipated by Eshita et al. '254 is improper. Applicants respectfully request withdrawal of this rejection under Section 102 (b).

EP 445,319 A1 Does Not Disclose Every Element of the Claims

Claims 1, 2, 5–22, 25–42, and 50–53 stand rejected under 35 U.S.C. § 102(b) as assertedly anticipated by EP 445,319. Claims 1, 21, 41, 42, 50, and 52 are independent claims. The Office Action asserts that EP 445,319 discloses the claimed method of deposition of silicon carbide on a substrate using the claimed precursors within the claimed temperature, flow rate, and pressure.

EP 445319 does not disclose control of the stress of a silicon carbide or ceramic film by controlling the flow rate of a silicon precursor, with other parameters fixed, as claimed in claims 21, 42, and 52. Moreover, EP 445319 uses a plasma-enhanced chemical vapor deposition process (PECVD) as opposed to the low pressure chemical vapor deposition process (LPCVD) used by the present invention when controlling residual film stress by control of reaction chamber pressure. As known to one of ordinary skill in the art, the PECVD process and the LPCVD process are quite different. The energy input to the different processes is accomplished in different manners and they presently operate in significantly different temperature ranges. The process parameter values of one process do not directly correlate to the process parameter values of the other process. Claim 1 of the present application has been amended accordingly to recite use of the LPCVD process when controlling the deposited film stress by control of

Appl. No. 10/716,006
Amendment Dated March 20, 2006
Reply to Office Action of December 28, 2005

chamber pressure.

Eshita et al. '254 does not disclose adjusting deposition parameters to control stress in a deposited film as claimed in the present application, as amended. Nor are the corresponding arrangements of fixed and variable parameters in the independent claims present, as disclosed in the detail of the claims.

Because EP 445319 does not disclose one or more elements of the independent claims of the present application, as amended, rejection of these claims under 35 U.S.C. § 102(b) as anticipated by EP 445319 is improper. Applicants respectfully request withdrawal of this rejection under Section 102 (b).

The Article by Sarro et al. Does Not Disclose All Elements of the Present Claims

Claims 1–4, 6, 9–14, 20–24, 29, 41, 42, and 50–53 stand rejected under 35 U.S.C. § 102(b) as assertedly anticipated by the article *Low-Stress PECVD SiC thin films for IC-compatible microstructures*, by Sarro et al. Claims 1, 21, 41, 42, 50, and 52 are independent claims. The Office Action asserts that Sarro et al. discloses the silicon carbide on the claimed substrates made by the claimed method.

Sarro et al. does not disclose control of film stress by either control of chamber pressure or control of silicon precursor flow rate, as claimed in the present application. Sarro et al. The influence of reactor pressure in a narrow range on the stress was noted, but control of the stress only as a function of low frequency power and of temperature is disclosed. Moreover, Sarro et al. teaches only use of a PECVD process, unlike the LPCVD process claimed in claim 1 of the present application, as amended. Sarro et al. does not disclose adjusting deposition parameters of pressure and precursor flow rate to control stress in a deposited film as claimed in the present application, as amended. Nor are the corresponding arrangements of fixed and variable parameters in the independent claims present, as disclosed in the detail of the claims.

Because Sarro et al. does not disclose one or more elements of the independent claims of the present application, as amended, rejection of these claims under 35 U.S.C. § 102(b) as anticipated by Sarro et al. is improper. Applicants respectfully request withdrawal of this rejection under Section 102 (b).

Appl. No. 10/716,006
Amendment Dated March 20, 2006
Reply to Office Action of December 28, 2005

Dependent Claims

The dependent claims depend from an independent claim that, as amended, is believed to be allowable, as discussed above. Therefore, the dependent claims are also believed to be allowable. Moreover, the dependent claims are allowable on their own merits. For example, dependent claims 18–20 and 38–40 relate to control of the electrical resistivity of the deposited film. None of the cited references discloses control of the electrical resistivity as claimed by these claims.

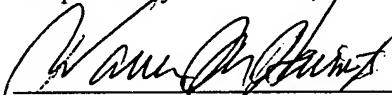
It is believed that there is no fee associated with the filing and consideration of this response. **Should the Commissioner decide that any fee is due, the Commissioner is hereby authorized to charge any and all fees incurred as a result of this response to deposit account number 03-0172.**

Conclusion

Claims 1–42 and 50–53 are pending in the application. Claims 43–49 are withdrawn. In view of the above remarks and amendments, it is respectfully submitted that claims 1–42 and 50–53 are in condition for allowance. Prompt notice of allowance of claims 1–42 and 50–53 is respectfully requested.

Date: 3/29/06

Respectfully submitted,



Warren M. Haines II (Reg. No. 40,632)
Customer No. 24024